Amendments to the Claims:

This listing of the claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

Claim 1 (currently amended): A method of ~~displaying~~ processing ~~a~~ three-dimensional image data for a three-dimensional volumetric display having a plurality of display elements, the method comprising:

generating three-dimensional image data ~~for a plurality of pixels, the three-dimensional image data~~ comprising (x,y,z) coordinate and color information, wherein the z-coordinate information represents image depth information; and

storing the three dimensional image data at locations in a multiplanar frame buffer in accordance with the z-coordinate information.

Claim 2 (currently amended): The method of claim 1 wherein the storing comprises:

reading the z-coordinate information;

scaling the z-coordinate information within a range corresponding to ~~a number of~~ one or more display elements in the three-dimensional volumetric display upon which the three-dimensional image ~~data~~ is to be displayed; and

assigning memory locations in the multiplanar frame buffer for the three-dimensional image data based on the scaled z-coordinate information.

Claim 3 (canceled)

Claim 4 (currently amended): The method of claim 1 wherein the storing comprises storing the three-dimensional image data having substantially identical z-coordinate information in memory locations of the multiplanar frame buffer ~~that are logically substantially proximate~~ corresponding to a two-dimensional slice of the three-dimensional image to be displayed as a plurality of pixels on one or more display elements of the three-dimensional volumetric display.

Claim 5 (currently amended): The method of claim 1 ~~further comprising displaying an image on a~~ wherein the three-dimensional volumetric display ~~having~~ has addressable (x,y,z) coordinates.

Claim 6 (currently amended): The method of claim 5 wherein the storing further comprises assigning ~~a~~ memory ~~location~~ locations in the multiplanar frame buffer for the three dimensional image data in accordance with the equation:

$$Addr=N_{b/p}*(x+N_x*y+N_x*N_Y*z_i)$$

wherein Addr is the assigned memory location in the multiplanar frame buffer for image data having coordinates (x,y,z), $N_{b/p}$ is the number of bytes of information stored for each pixel, N_x is the number of pixels in the x direction of ~~a~~ the three-dimensional volumetric display, N_Y is the number of pixels in the y dimension of ~~a~~ the three-dimensional volumetric display, and Z_i is an integer portion of the scaled z-coordinate value.

Claim 7 (currently amended): The method of claim 1 ~~further comprising displaying an image on a~~ wherein the three-dimensional volumetric display ~~having~~ has addressable (r, y' and theta) coordinates.

Claim 8 (currently amended): The method of claim 7 wherein the storing further comprises assigning ~~a~~ memory ~~location~~ locations in the multiplanar frame buffer for the three dimensional image data in accordance with the equation:

$$Addr=N_{B/p}*(r*cosine\ (theta)+[[N_x]]\underline{N_r}*y' +[[N_x]]\underline{N_r}*[[N_y]]\underline{N_{y'}}*r*sine\ (theta))$$

wherein Addr is the assigned memory location in the multiplanar frame buffer for image data having coordinates (r, y' and theta), $N_{B/P}$ is the number of bytes of information stored for each pixel, [[N_x]]N_r is the number of pixels in the [[x]]r direction of ~~a~~ the three-dimensional volumetric display, and [[N_Y]]$N_{y'}$ is the number of pixels in the [[y]]y' dimension of ~~a~~ the three-dimensional volumetric display~~, and Z_i is an integer portion of the scaled z-coordinate value~~.

Claim 9 (currently amended): The method of claim 1 wherein the storing comprises:

providing a first memory ~~at least as large as the frame buffer~~;

~~filling~~ storing ~~the first memory with~~ the three dimensional image data in the first memory; and

~~transmitting the contents of~~ transferring the three dimensional image data stored in the first memory ~~location~~ to the multiplanar frame buffer ~~in a single operation~~.

Claims 10-11 (canceled)

Claim 12 (currently amended): The method of claim 1 further comprising ~~transmitting~~ transferring the three-dimensional image data to ~~a~~ the three-dimensional volumetric display in accordance with the z-coordinate information.

Claim 13 (currently amended): The method of claim 1 wherein the three-dimensional image data further comprises transparency information and brightness information.

Claims 14-15 (canceled)

Claim 16 (currently amended): The method of claim ~~1~~ 12 further comprising displaying an image on ~~a~~ the three dimensional volumetric display.

Claim 17 (currently amended): The method of claim 16 wherein the plurality of display elements of the three dimensional volumetric display comprises multiple planes upon which the image ~~data~~ is displayed.

Claim 18 (original): The method of claim 16 wherein the three dimensional volumetric display comprises a plurality of self-luminescent optical elements.

Claim 19 (original): The method of claim 16 wherein the three dimensional volumetric display is a swept-volume display.

Claim 20 (currently amended): The method of claim 1 wherein the generating comprises generating the three-dimensional image data with a personal computer.

Claim 21 (currently amended): The method of claim 1 wherein the generating comprises converting ~~data corresponding to a~~ the three-dimensional image data into data corresponding to a plurality of two-dimensional cross-sectional images ~~of~~ forming the three-dimensional image.

Claim 22 (currently amended): The method of claim 1 wherein the generating comprises generating the three-dimensional image data ~~using~~ by an application ~~program~~ programming interface ~~calls~~.

Claim 23 (currently amended): The method of claim 1 wherein the generating comprises generating the three-dimensional image data ~~indicating~~ from a plurality of geometric primitives ~~that define three-dimensional image~~.

Claims 24-46 (canceled)

Claim 47 (currently amended): A three dimensional image display system comprising:

a multiplanar frame buffer, ~~and~~

a ~~microprocessor~~ graphics data processor ~~programmed to: generate~~ for generating three-dimensional image data ~~for a plurality of pixels, the three-dimensional image data~~ comprising (x,y,z) coordinate and color information, wherein the z-coordinate information represents image depth information[[;]] and for storing ~~store~~ the three dimensional image data at memory locations in ~~a~~ the multiplanar frame buffer in accordance with the z-coordinate information, and

a three-dimensional volumetric display having a plurality of display elements on which image data stored in the multiplanar frame buffer may be displayed as a plurality of pixels.

Claim 48 (currently amended): The three dimensional image display system of claim 47 wherein the ~~microprocessor~~ graphics data processor ~~is further programmed to:~~

~~read~~ reads the z-coordinate information;

~~scale~~ scales the z-coordinate information within a range corresponding to ~~a number of~~ one or more display elements in the three-dimensional volumetric display upon which the three dimensional image ~~data~~ is to be displayed; and

~~assign~~ assigns memory locations in the multiplanar frame buffer for the three-dimensional image data based on the scaled z-coordinate information.

Claim 49 (canceled)

Claim 50 (currently amended): The three dimensional image display system of claim 47 ~~wherein the~~ wherein the ~~microprocessor~~ graphics data processor ~~is further programmed to store~~ stores the three dimensional image data having substantially identical z-coordinate information in memory locations of the multiplanar frame buffer ~~that are logically substantially proximate~~ that correspond to a two-dimensional slice of the three-dimensional image to be displayed on one or more display elements of the three-dimensional volumetric display.

Claim 51 (currently amended): The three dimensional image display system of claim 47 wherein the ~~microprocessor is further programmed to display an image on a~~ three-dimensional volumetric display ~~having~~ has addressable (x,y,z) coordinates.

Claim 52 (currently amended): The three dimensional image display system of claim 51 ~~wherein the~~ wherein the ~~microprocessor~~ graphics data processor is further ~~programmed~~ designed to assign ~~a~~ memory ~~location~~ locations in the multiplanar frame buffer for the three dimensional image data in accordance with the equation:

$$Addr=N_{b/p}*(x+N_x*y+N_x*\ N_y*z_i)$$

wherein Addr is the assigned memory location in the multiplanar frame buffer for image data having coordinates (x,y,z), $N_{b/p}$ is the number of bytes of information stored for each pixel, N_x is the number of pixels in the x direction of [[a]] the three-dimensional volumetric display, N_y is the number of pixels in the y dimension of [[a]] the three-dimensional volumetric display, and Z_i is an integer portion of the scaled z-coordinate value.

Claim 53 (currently amended): The three dimensional image display system of claim 47 wherein the ~~microprocessor is further programmed to display an image on a~~ the three-dimensional volumetric display ~~having~~ has addressable (r, y' and theta) coordinates.

Claim 54 (currently amended): The three dimensional image display system of claim 53 wherein the ~~microprocessor~~ graphics data processor is further ~~programmed~~

designed to assign ~~a~~ memory ~~location~~ locations in the multiplanar frame buffer for the three dimensional image data in accordance with the equation:

$$Addr = N_{B/P} * (r * cosine\ (theta) + [[N_x]]N_r * y' + [[N_x]]N_r * [[N_y]]N_y * r * sine\ (theta))$$

wherein Addr is the assigned memory location in the multiplanar frame buffer for a pixel having coordinates (r, y' and theta), $N_{B/P}$ is the number of bytes of information stored for each pixel, $[[N_x]]N_r$ is the number of pixels in the [[x]]r direction of [[a]] the three-dimensional volumetric display, and $[[N_y]]N_{y'}$ is the number of pixels in the [[y]]y' dimension of [[a]] the three-dimensional volumetric display~~, and Z_f is an integer portion of the scaled z-coordinate value~~.

Claim 55 (currently amended): The three dimensional image display system of claim 47 further including a first memory, wherein the ~~microprocessor~~ graphics data processor is further ~~programmed~~ designed to

~~provide a first memory at least as large as the frame buffer~~;

~~fill the first memory with~~ store the three dimensional image data in the first memory; and

~~transmit the contents of~~ transfer the three dimensional image data stored in the first memory ~~location~~ to the multiplanar frame buffer ~~in a single operation~~.

Claims 56-57 (canceled)

Claim 58 (currently amended): The three dimensional image display system of claim 47 wherein the ~~microprocessor~~ graphics data processor is further ~~programmed~~ designed to ~~transmit~~ transfer the three-dimensional image data to ~~a~~ the three-dimensional volumetric display in accordance with the z-coordinate information.

Claim 59 (currently amended): The three dimensional image display system of claim 47 wherein the three dimensional image data further comprises transparency information and brightness information.

Claims 60-61 (canceled)

Claim 62 (currently amended): The three dimensional image display system of claim ~~47~~ 58 wherein the ~~microprocessor~~ graphics data processor is further ~~programmed~~ designed to display an image on ~~a~~ the three dimensional volumetric display.

Claim 63 (currently amended): The three dimensional image display system of claim 62 wherein the plurality of display elements of the three dimensional volumetric display comprises multiple planes upon which the image ~~data~~ is displayed.

Claim 64 (currently amended): The three dimensional image display system of claim 62 wherein the three dimensional volumetric display comprises a plurality of self-luminescent optical elements.

Claim 65 (currently amended): The three dimensional image display system of claim 62 wherein the three dimensional volumetric display is a swept-volume display.

Claim 66 (currently amended): The three dimensional image display system of claim 47 wherein the ~~microprocessor~~ graphics data processor is further ~~programmed~~ designed to generate the three-dimensional image data with a personal computer.

Claim 67 (currently amended): The three dimensional image display system of claim 47 wherein the ~~microprocessor~~ graphics data processor is further ~~programmed~~ designed to convert ~~data corresponding to a~~ the three-dimensional image data into data

corresponding to a plurality of two-dimensional cross-sectional images ~~of~~ that form the three-dimensional image.

Claim 68 (currently amended): The three dimensional image display system of claim 47 wherein the ~~microprocessor~~ graphics data processor is further ~~programmed~~ designed to generate the three-dimensional image data ~~using~~ by an application ~~program~~ programming interface ~~calls~~.

Claim 69 (currently amended): The three dimensional image display system of claim 47 wherein the ~~microprocessor~~ graphics data processor is further ~~programmed~~ designed to generate the three dimensional image data ~~indicating~~ from a plurality of geometric primitives ~~that define three-dimensional image~~.

Claim 70 (new): The method of claim 13 further comprising the step of discarding the three dimensional image data associated with a second pixel if the transparency information associated with a first pixel indicates that the first pixel is opaque, when the first pixel and the second pixel have the same (x,y) coordinate values, and the z-coordinate value associated with the second pixel indicates that the second pixel is behind the first pixel.

Claim 71 (new): The method of claim 13 further comprising the step of modulating the color information associated with a second pixel based on the transparency information associated with a first pixel, when the first pixel and the second pixel have the same (x,y) coordinate values, and the z-coordinate value associated with the second pixel indicates that the second pixel is behind the first pixel.

Claim 72 (new): The method of claim 13 further comprising the step of modulating the brightness information associated with a second pixel based on the transparency information associated with a first pixel, when the first pixel and the second pixel have the same (x,y) coordinate values, and the z-coordinate value associated with the second pixel indicates that the second pixel is behind the first pixel.

Claim 73 (new): The three dimensional image display system of claim 59, wherein the graphics data processor is further designed to discard the three dimensional image data associated with a second pixel if the transparency information associated with a first pixel indicates that the first pixel is opaque, when the first pixel and the second pixel have the same (x,y) coordinate values, and the z-coordinate value associated with the second pixel indicates that the second pixel is behind the first pixel.

Claim 74 (new): The three dimensional image display system of claim 59, wherein the graphics data processor is further designed to modulate the color information associated with a second pixel based on the transparency information associated with a first pixel, when the first pixel and the second pixel have the same (x,y) coordinate values, and the z-coordinate value associated with the second pixel indicates that the second pixel is behind the first pixel.

Claim 75 (new): The three dimensional image display system of claim 59, wherein the graphics data processor is further designed to modulate the brightness information associated with a second pixel based on the transparency information associated with a first pixel, when the first pixel and the second pixel have the same (x,y) coordinate values, and the z-coordinate value associated with the second pixel indicates that the second pixel is behind the first pixel.

Claim 76 (new): The method of claim 1 wherein the storing comprises storing the three-dimensional image data having substantially identical z-coordinate information in memory locations within one common physical partition of the multiplanar frame buffer.

Claim 77 (new): The method of claim 1 wherein the storing comprises storing the three-dimensional image data having substantially identical z-coordinate information in memory locations within one common logical partition of the multiplanar frame buffer.

Claim 78 (new): The three dimensional image display system of claim 47 wherein the graphics data processor is further designed to store image data having substantially identical z-coordinate information in memory locations within one common physical partition of the multiplanar frame buffer.

Claim 79 (new): The three dimensional image display system of claim 47 wherein the graphics data processor is further designed to store image data having substantially identical z-coordinate information in memory locations within one common logical partition of the multiplanar frame buffer.

Claim 80 (new): The method of Claim 1, wherein the multiplanar frame buffer is located in the three-dimensional volumetric display.

Claim 81 (new): The three dimensional image display system of Claim 47, wherein the multiplanar frame buffer is located in the three-dimensional volumetric display.

Claim 82 (new): The method of Claim 9, wherein the first memory comprises a multiplanar frame buffer.

Claim 83 (new): The three dimensional image display system of Claim 55, wherein the first memory comprises a multiplanar frame buffer.

Claim 84 (new): The method of Claim 1, wherein the storing comprises:

processing the three dimensional image data;

assigning memory locations in the multiplanar frame buffer for the three dimensional image data in accordance with the (x,y,z) coordinate information; and

transferring the processed three dimensional image data to the assigned memory locations in the multiplanar frame buffer.

Claim 85 (new): The method of Claim 84, wherein the processing comprises performing depth testing.

Claim 86 (new): The method of Claim 84, wherein the processing comprises performing multiplanar antialiasing.

Claim 87 (new): The method of Claim 84, wherein the processing comprises performing alpha blending.

Claim 88 (new): The three dimensional image display system of Claim 47, wherein the graphics data processor is further designed to:

process the three dimensional image data;

assign memory locations in the multiplanar frame buffer for the three dimensional image data in accordance with the (x,y,z) coordinate information; and

transfer the processed three dimensional image data to the assigned memory locations in the multiplanar frame buffer.

Claim 89 (new): The three dimensional image display system of Claim 88, wherein the graphics data processor is further designed to perform depth testing.

Claim 90 (new): The three dimensional image display system of Claim 88, wherein the graphics data processor is further designed to perform multiplanar antialiasing.

Claim 91 (new): The three dimensional image display system of Claim 88, wherein the graphics data processor is further designed to perform alpha blending.